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June 8, 2007

Thomas J. Flynn, III  
South Carolina Department of  
Health and Environmental Services  
Bureau of Air Quality  
Air Assessment and Planning  
2600 Bull Street  
Columbia, SC 29201

**RE: Comments  
Network Description and Ambient Air Network  
Monitoring Plan, Calendar Year 2008**

Dear Mr. Flynn:

Our firm represents the following entities with regard to the Upstate PM<sub>2.5</sub> designation and, specifically, with regard to concerns about the downtown Greenville PM<sub>2.5</sub> monitor ("Greenville PM<sub>2.5</sub> Monitor"): Anderson County, Greenville County, Spartanburg County, the City of Greenville, the Anderson Chamber of Commerce, the Greater Greenville Chamber of Commerce, the Spartanburg Chamber of Commerce, and the Spartanburg Development Association. You have received or will receive individual comments from at least some of these entities supporting the efforts that the Bureau of Air Quality Control ("Bureau of Air") and other sections within the Department of Health and Environmental Control ("DHEC") have undertaken in reviewing the state-wide monitor network and in recommending changes based upon the review. On behalf of our clients, we want to again express our appreciation for the efforts involved in the Network Description and Ambient Air Network Monitoring Plan ("Monitoring Plan").

It should be noted at the outset that each of our clients places the highest priority on environmental quality, including the quality of our air. We believe that the Upstate environment is one reason so many people find our area desirable as a place to live and as a place to do business. It is imperative, however, that decisions concerning the environment, particularly decisions with the potential of serious economic consequences, be based on reliable and representative information. Based on the information outlined below and in the attachments to this letter, we believe that modifications to the Monitoring Plan need to be made in order to: (1) acknowledge concerns with the current Greenville PM<sub>2.5</sub> Monitor location; (2) provide for immediate designation of the current monitor as a special purpose monitor for further evaluation of air quality around adjacent residences; and (3) provide for immediate installation of a new monitor meeting the applicable siting criteria for evaluation of area-wide compliance with National Ambient Air Quality Standards.

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In reviewing the Monitoring Plan there are both general and specific comments that we want to make with regard to some statements and conclusions pertaining to PM<sub>2.5</sub>. In addition, we want to share with you an evaluation of the location for the Greenville PM<sub>2.5</sub> Monitor by top experts in the field. These experts include one person who was former Director of the Air and Waste Management Division at the Environmental Protection Agency's ("EPA's") Region 4, as well as Chief of the Air Branch at the EPA's Region 1, and one person who has over 25 years of experience in implementation of ambient monitoring programs and policy development with EPA. The evaluation performed by these experts is included as Attachment A to this letter and incorporated herein.

As you are aware, EPA designated all of Anderson, Greenville, and Spartanburg Counties as "unclassifiable" for PM 2.5 in January of 2005. The reasons for the unclassifiable designation are: (1) the Greenville PM<sub>2.5</sub> Monitor was showing high PM<sub>2.5</sub> readings at certain times of the year; and (2) Anderson and Spartanburg Counties have emissions and population levels that potentially contribute to the high PM<sub>2.5</sub> levels seen at the Greenville PM<sub>2.5</sub> Monitor. This matter is of great concern to our clients and to businesses located in the Upstate because any classification other than "attainment" can be a deterrence to industrial growth. If the Upstate area should be reclassified as "non-attainment" we believe that the impact on industrial growth and the economy of the Upstate could be severely impacted based on what has occurred in non-attainment areas in other parts of the country.

The core of our concern with the classification involves the physical location of the Greenville PM<sub>2.5</sub> Monitor. As has been communicated to DHEC, the Greenville PM<sub>2.5</sub> Monitor was placed in its current location because a carbon monoxide monitor was already present – there is no indication that PM<sub>2.5</sub> siting criteria for the Greenville PM<sub>2.5</sub> Monitor were ever considered. Consequently, the Greenville PM<sub>2.5</sub> Monitor is located as close as 50 meters to houses that are known to have burned wood and coal during cold periods. In addition, the monitor platform is located on a slope above the nearby houses such that the monitor intake is located approximately 20 feet above chimney height.

We want to emphasize that our clients are not blaming the nearby residents for the unrepresentative data at the Greenville PM<sub>2.5</sub> Monitor. Instead, we are pointing out the flaw of locating a PM<sub>2.5</sub> monitor as close as 50 meters to chimneys and above chimney height in contravention of the PM<sub>2.5</sub> location criteria and established federal guidance.

DHEC itself has documented that filters from an adjacent total suspended particulate monitor have, on days showing high PM 2.5 levels, carbonaceous material

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imbedded in the filter media as well as larger combustion products including wood, wood ash, petroleum, etc. collected on the filter. *Letter from Robert W. King, Deputy Commissioner, DHEC Environmental Quality Control, to J. I. Palmer, Jr., EPA Region IV Administrator* (September 8, 2004) (included as Attachment B to this letter and incorporated herein). These facts, along with the observation that high PM<sub>2.5</sub> days at the Greenville PM<sub>2.5</sub> Monitor have typically occurred on the coldest days, indicate that the Greenville PM<sub>2.5</sub> Monitor is being unduly influenced at certain times by local sources because of the location of the monitor. We note that the Greenville Monitor is not necessarily affected by these local sources at all times, but the Greenville PM<sub>2.5</sub> Monitor has been and can be substantially affected during periods when local residents supplement their heat by burning wood and coal.

As DHEC's review of the monitor network progressed, it became apparent that location concerns pertain to other monitors and not just to the Greenville PM<sub>2.5</sub> Monitor. The Monitoring Plan proposes evaluating the relocation of the current Taylors monitor and the current West View monitor due to potential impact from local sources. We believe that the relocation of these monitors is appropriate because there appears to be potential and actual impact to these monitors from local sources which are not representative of large scale exposure. We support DHEC's view that these monitors should be relocated.

In addition to the general comments outlined above, we offer the following specific comments to the Monitoring Plan:

**Specific Comment 1.** The next to the last paragraph in the Introduction section states as follows:

All criteria pollutant monitors and samplers are cited and operated consistent with the requirements of 40 C.F.R. Section 58 and Appendices A (Quality Assurance) C (Methods), D (Network Design) and E (Pro-Siting) and the data collected by these samplers and monitors is suitable for comparison to the National Ambient Air Quality Standards.

We realize that, at times, a distinction has been made between the "must" requirements and the "should" requirements in the above reference regulations, appendices, and related guidance. As previously mentioned, this is an extremely important issue for the Upstate economy -- every care should be taken to assure representative data from our monitors. Consequently, DHEC should go beyond the minimal requirements (the "must" requirements) and comply with each of the siting standards set forth in the applicable regulations and guidance.

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At its current location, the Greenville PM<sub>2.5</sub> Monitor is not in compliance with the following "must" requirements:

- "[T]he required height of the air intake for middle or larger scales is 2-15 meters." 40 C.F.R. Part 58, App. E.8.1. While the intake for the Greenville PM<sub>2.5</sub> Monitor is approximately 4 meters off of the ground, the monitor is on a slope such that the prevailing downwind area being monitored is far lower than the monitor intake. In fact, the monitor intake is approximately 20 feet higher than the chimneys of adjacent houses, thereby making the monitor unduly susceptible to smoke from the fireplaces. Considering the slope of the monitor location, the Greenville PM<sub>2.5</sub> Monitor does not meet the 2-15 "must" requirement.

- "The Sampler must also be located away from obstacles such as buildings, so that the distance between obstacles and the sampler is at least twice the height that the obstacle protrudes above the sampler except for street canyon sites." *Id.* Two large trees are located close to the Greenville PM<sub>2.5</sub> Monitor such that this criteria is not met.

While criteria set forth in federal guidance documents may be considered "should" requirements, we believe that meeting these standards is crucial to assuring representative data. Consequently, the Monitoring Plan should clarify and ensure that monitors and samplers are sited and operated consistent with the guidance documents referenced in the aforementioned appendices at 40 C.F.R. Part 58. In particular, with respect to PM<sub>2.5</sub>, Section 4.7.1(b)(3) of Appendix D states that "additional technical guidance for siting PM 2.5 monitors is provided in references 6 and 7 of this Appendix." Reference 7 is a document entitled *Guidance for Network Design and Optimum Site exposure for PM 2.5 and PM 10* ("Guidance Document"). This particular *Guidance Document* contains criteria that directly relate to our concerns regarding the PM<sub>2.5</sub> monitor locations. In particular, the Greenville PM<sub>2.5</sub> Monitor is not in compliance with the following criteria set forth in the *Guidance Document*:

- "The core monitoring sites should adequately reflect area-wide average air quality." *Guidance Document*, Page 5-5, Section 5.5.3.

- "The monitor should be located outside the zone of influence of sources located within the designated zone of representation for the monitoring site . . . for larger than middle-scale monitoring, no unpaved roads with significant traffic or residential wood burning appliances should be located within 100 m of the monitoring location." *Guidance Document*, Page 5-2, Section 5.2 (emphasis added).

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- “A monitor placed at the fence line of an emission source would not be considered to represent community exposures, even though there might be residences abutting the fence line.” *Guidance Document*, Page 2-13, Section 2.2.3.

- “Access to the sampling platform should be controlled by fencing or elevation above ground level. Sampler inlet should be sufficiently distant (> 10 m) from public access to preclude purposeful contamination from reaching them in sufficient quantities to bias samples. Access should be controlled by a locked door, gate, or ladder with documentation of site visitations and the purposes of those visits.” *Guidance Document*, Page 5-1, Section 5.1.

- “Large nearby buildings and trees extending above the height of the monitor may present barriers or deposition surfaces for PM. Certain trees may also be sources of PM in the form of detritus, pollen, or insect parts. These can be avoided by locating samplers by placing them > 20 m from nearby trees, and twice the difference in elevation difference from nearby buildings or other obstacles.” *Guidance Document*, Page 5-2, Section 5.2.

Given the extreme importance of having a representative monitor network, we ask that the introduction in the Air Network Monitoring Plan specify that monitors and samplers must be sited and operated consistent with guidance documents contained in the mentioned appendices. In addition, all PM<sub>2.5</sub> monitors used for the purpose of determining attainment with the National Ambient Air Quality Standards should meet the requirements set forth in the *Guidance Document*. Finally, the Monitoring Plan should include failure to meet siting criteria as justification for relocating the Greenville PM<sub>2.5</sub> Monitor.

**Specific Comment 2.** Page 13 of the Monitoring Plan contains a description of the Greenville PM<sub>2.5</sub> Monitor along with pertinent observations. Included in this description is the following sentence: “Several intensive monitoring projects have demonstrated that the site is representative of PM 2.5 concentrations on a neighborhood or larger scale.” First, statistical analysis should be performed on the data from the various monitors to determine whether this statement is accurate. Second, we believe that this statement overlooks previous observations by DHEC as stated in Attachment B to this letter, which is incorporated herein. These statements include:

- “Apart from the process for attainment determination, DHEC is concerned about the atypical impacts on air quality indicated by the Greenville EQC sampling.”

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- “However, there are a few days each winter where concentrations measured at the Greenville EQC site deviate from typical relationship seen across the area.”
- “TSP filters collected on the atypical days have been examined using polarized light microscopy. These filters collected on these days are all dark gray to black in color and have a smell characteristic of combustion.”
- “The microscopic examination shows that in all cases examined, the TSP filters collected on the atypical days have fine carbonaceous material deeply embedded in the filter media and have larger combustion products (including wood, wood ash, petroleum, etc.) collected on the filter. Samples collected on days surrounding the atypical days have significantly less evidence of combustion products and more significantly, the fine embedded material is primarily crustal (soil).”

We are aware that DHEC has conducted a special monitoring study as referenced in the Monitoring Plan. The Monitoring Plan, however, overlooks the fact that none of the atypical days described by DHEC at Attachment B occurred during the time of the special study. Consequently, the special study does not account for the concern that the Greenville PM<sub>2.5</sub> Monitor is impacted at certain periods by nearby residents burning wood and coal. It is suspected that DHEC’s meetings with residents near the Greenville PM<sub>2.5</sub> Monitor has caused them to not have fires during cold periods, but this behavior could certainly reoccur in the future. In addition, the Monitoring Plan does not address the past data from atypical days that are contributing to the “unclassifiable” designation for the Upstate area.

Failure to meet the established siting criteria and the above observations by DHEC should be included in the Monitoring Plan as justification for relocating the Greenville PM<sub>2.5</sub> Monitor.

**Specific Comment 3.** The Monitoring Plan states that the Department “may” recommend relocation of the Greenville PM<sub>2.5</sub> monitor after one year of concurrent operation with an additional monitor.

We believe that facts available at this time more than justify immediate termination of the current Greenville PM<sub>2.5</sub> Monitor as a device for measuring attainment with National Ambient Air Quality Standards. First, the current Greenville PM<sub>2.5</sub> Monitor fails to meet certain regulatory requirements as well as almost all criteria set forth in the *Guidance Document*, all of which are intended to assure representative data. Secondly,

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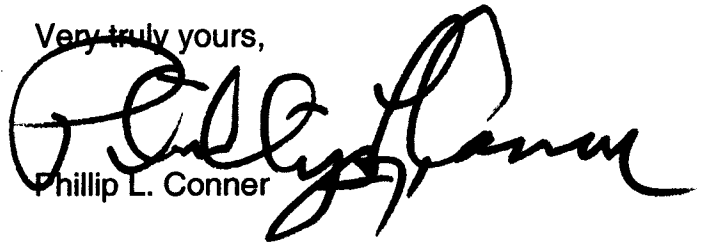
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as noted above by DHEC, atypical results have occurred from the Greenville PM<sub>2.5</sub> Monitor. For these reasons, an alternative location should immediately be established for the Greenville PM<sub>2.5</sub> Monitor, and this alternative location should meet all applicable siting criteria. The current Greenville PM<sub>2.5</sub> Monitor can be designated as a special purpose monitor in order to monitor air quality for the nearby residences.

**Specific Comment 4.** It appears that, in addition to the Greenville PM<sub>2.5</sub> Monitor, the Taylors monitor and the West View monitor fail to meet most of the siting criteria set forth in the *Guidance Document* for assuring representative data. We support DHEC's recommendation in the Monitoring Plan to relocate these monitors, but the Monitoring Plan should cite failure to meet siting criteria as justification for relocating the monitors. These monitors should be relocated to an area that meets all applicable siting criteria.

Once again, we appreciate the efforts of the Bureau of Air and DHEC in conducting the statewide monitor review. Thank you for your consideration of our comments. Please let me know if you have any question.

Very truly yours,



Phillip L. Conner

PLC:rg

Attachments

cc: Myra C. Reece (with attachments)  
Renee Baecker (with attachments)

BOARD:  
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September 8, 2004

Mr. J. I. Palmer, Jr.  
Regional Administrator  
United States Environmental Protection Agency Region 4  
Atlanta Federal Center  
61 Forsyth Street  
Atlanta, Georgia 30303-8960

Dear Mr. Palmer:

This letter and attachment is provided to reaffirm and support our recommendation of attainment for the Particulate Matter 2.5 (PM<sub>2.5</sub>) National Ambient Air Quality Standard (NAAQS) for the entire State of South Carolina. We believe the additional data and information contained herein address any concerns that the United States Environmental Protection Agency (EPA) might have with regards to the ambient monitoring data collected in the Greenville-Spartanburg Monitoring Planning Area (MPA) and its application for comparison to the NAAQS.

On February 13, 2004, on behalf of the Governor of South Carolina, the South Carolina Department of Health and Environmental Control (DHEC) submitted a recommendation of attainment for the entire state of South Carolina for the PM<sub>2.5</sub> standard. This recommendation was based on complete and quality assured data for the years 2001, 2002, and 2003 as requested by EPA and as identified in the April 1, 2003 *Designations for the Fine Particle National Ambient Air Quality Standards* memorandum. This memorandum stated that EPA's designations would be based on the most recent three (3) consecutive calendar years of air quality data (i.e., 2001 – 2003) from Federal reference or equivalent method monitors.

On June 29, 2004, EPA notified South Carolina of its intent to make modifications to the State's recommendations. EPA stated that while the Greenville EQC, Greenville County, monitor (AIRS #045-045-0008) had not been in operation for three calendar years, it had the potential to violate the PM<sub>2.5</sub> standard; therefore, EPA was recommending that the Greenville-Spartanburg area be designated as unclassifiable until the monitor had operated for three full calendar years.

The Greenville EQC sampler was placed into operation in August 2001 and collects samples every third day. This sampler is in addition to the two 'core' samplers required for the MSA by title 40 chapter I, part 58 Appendix D of the Code of Federal Regulations (CFR) – *Network Design for State and Local Monitoring Stations (SLAMS), National Monitoring Air Network*

## ATTACHMENT B



*Stations (NAMS), and Photochemical Assessment Monitoring Stations (PAM).* It is located near downtown Greenville at a site that was originally established to monitor carbon monoxide. The Greenville EQC Federal Reference Method sampler (FRM) is located midway, and on a straight line, between the Taylors, Greenville County, PM2.5 FRM sampler (045-045-0009) and the Powdersville, Anderson County, continuous PM2.5 monitor (045-0007-003). The Greenville EQC monitor is 6 miles southwest of Taylors and 6 miles northeast of Powdersville. The other PM2.5 FRM sampler in the area is West View, Spartanburg County (045-083-0010), located approximately 23 miles to the northeast of the Greenville EQC sampler. These monitors demonstrate attainment of the annual and 24-hour PM2.5 NAAQS.

Review of 40 CFR Part 58, Ambient Air Quality Surveillance, indicates spatial averaging to be the most appropriate approach for determining community-oriented area-wide PM exposure levels. The epidemiological studies used as the basis for the PM2.5 NAAQS, used spatial averaging in the review of the health effects data to more appropriately reflect average community-oriented area-wide PM exposure levels. In the discussion accompanying the Final Rule, it was affirmed that the greatest risk was associated with the low to mid-range concentrations, as opposed to the few peak 24-hour concentrations. The rule had been revised to clarify that the implementing agencies have the flexibility to use spatial averaging where appropriate. Under separate cover, DHEC will submit a revision to the South Carolina Fine Particulate Monitoring Plan to utilize spatial averaging for both the Greenville-Spartanburg and Columbia areas. All areas of the state have been reviewed, and it has been determined that spatial averaging is appropriate for these two Monitoring Planning Areas.

A review of the data from the core and supplemental samplers, supporting information describing population density, transportation, land, and heating fuel use, and impacts from the emissions from the regional point and mobile sources in the area all show that a spatial averaging approach in the Community Monitoring Zone (CMZ) defined by the MPA is the appropriate method for comparison with the PM2.5 standard. The requirements for this averaging approach are that the sites being included 1) have relatively similar annual air quality (i.e., the average concentrations at individual sites shall not exceed the spatial average by more than 20 percent); 2) exhibit similar day to day variability (i.e., the monitoring sites should not have low day-to-day correlations; and, 3) the entire averaging area should principally be affected by the same major emission sources of PM2.5. Information supporting each of these three requirements and the data handling conventions and computations related to spatial averaging is contained in the Monitoring Plan, excerpted in the Attachment to this letter.

Apart from the process for attainment determination, DHEC is concerned about the atypical impacts on air quality indicated by the Greenville EQC sampling. We have taken immediate steps to evaluate the available data at the Greenville EQC and surrounding monitoring sites, investigate potential sources and unusual activity in the immediate area, and have begun implementation of additional focused monitoring to identify the possible sources and nature of the atypical cold season samples.

Available particulate and meteorological data have been reviewed to identify any patterns or correlations in the data. The particulate data indicates fine particulate concentrations at the

Greenville EQC site are typically consistent with concentrations measured at other monitoring sites in the Greenville-Spartanburg MPA and throughout the region encompassing northwestern South Carolina and adjacent areas in North Carolina. However, there are a few days each winter where concentrations measured at the Greenville EQC site deviate from typical relationship seen across the area. The nature and distribution of these unusual samples indicate impact at the monitoring site from a local particulate source(s).

Samples for Total Suspended Particulate (TSP) are also collected at the Greenville EQC site. TSP filters collected on the atypical days have been examined using Polarized Light Microscopy. The filters collected on these days are all dark gray to black in color and have a smell characteristic of combustion. The proportion of fine mass to TSP mass does not change significantly on the atypical days, indicating the local source(s) contribute to the total particulate load, not just fine, and is close enough to preclude the settling out of the larger particulate. The microscopic examination shows that in all cases examined, the TSP filters collected on the atypical days have fine carbonaceous material deeply embedded in the filter media and have larger combustion products (including wood, wood ash, petroleum, etc.) collected on the filter. Samples collected on days surrounding the atypical days have significantly less evidence of combustion products and more significantly, the fine embedded material is primarily crustal (soil). Collocated continuous nitrogen oxide and carbon monoxide data collected on the atypical days has also been examined and no unusual or characteristic concentrations or patterns are apparent on the atypical vs. typical days.

Review of event and location data obtained from the Greenville Fire Department have raised the possibility that several of the atypical samples may be due to the impacts of nearby structure fires. Also identified in close proximity of the monitor are residences that heat with wood, fuel oil, and coal. DHEC has requested assistance from EPA experts concerning residential wood burning, knowledge and experiences gained from other areas in the country, and potential financial assistance. Efforts are underway to involve the community early in the process of determining the best approach for outreach and education concerning air quality. DHEC's community liaison and the county health department will provide assistance with community involvement. Once a final outreach and education plan has been developed, it will be shared with EPA.

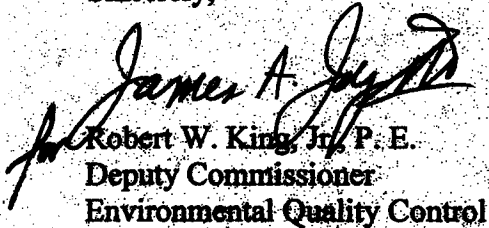
Additional data collection and analysis is also planned for the Greenville EQC site to gain better understanding of the nature of the atypical conditions during the winter quarters. Wind speed and wind direction equipment have already been installed and replacement of the building to accommodate the extra equipment is underway. Installation of a continuous PM2.5 monitor and an aethalometer for continuous analysis of light absorbing Carbon (LAC) is planned for October 2004. The monitoring plan developed to further investigate the nature of the impacts seen at the Greenville EQC sampler will be shared with EPA Region 4.

Since we know EPA shares DHEC's concerns about the efforts related to the Greenville EQC monitor and the surrounding area, DHEC will provide periodic updates concerning work done and data collected. DHEC intends to work closely with EPA for advice and assistance as we work with the community on this effort.

Mr. Palmer  
September 8, 2004  
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Thank you for your consideration of this information concerning the Greenville-Spartanburg area. While we are submitting this information at this time at EPA's request, we would expect that any additional information submitted within the 120-day consultation period would receive appropriate review and consideration. As stated at the beginning of this letter and based on the information submitted, EPA should designate this area and the rest of South Carolina as attainment with both the 24-hour and annual PM<sub>2.5</sub> standards. Should you have questions or need additional information, please do not hesitate to contact me at (803) 896-8940 or Myra Reece, Chief of the Bureau of Air Quality at (803) 898-4123.

Sincerely,

  
Robert W. King, Jr., P. E.  
Deputy Commissioner  
Environmental Quality Control

Attachment

Cc: Myra Reece, BAQ  
Beverly Barister, EPA